UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/995,715	12/22/1997	IVANOV ANATOLY GENNADIEVICH	0971/OD319	8165

7590 04/01/2005

DARBY & DARBY
805 THIRD AVENUE
NEW YORK, NY 10022

EXAMINER	
BRIER, JEFFERY A	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	08/995,715	GENNADIEVICH, IVANOV ANATOLY	
	Examiner	Art Unit	
	Jeffery A Brier	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *48,50,55-61,63,67,69,71,73,75-78,80 and 81* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *48, 50, 55-61, 63, 67, 69, 71, 73, 75-78, 80, and 81* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Response to Amendment

1. The amendment filed on 10/06/2004 has been entered.

Response to Arguments

2. The amendments to the claims overcomes the rejection based upon Ezra, however, the amended claims are not patentable over Lindenblad, US Patent No. 2,686,219, cited in the previous office action.

In addition claim 63 replaces that which applicant argues to make the claims patentable over Ezra with another limitation which is taught by Ezra.

Drawings

3. The drawings filed on 10/06/2004 have been approved.

Claim Objections

4. Claim 69 is objected to because of the following informalities: at line 1 of part (d) "a hologram blocks" should be changed to "hologram blocks" since the "a" infers one hologram block and at the last line of part (b) "of of" should be change to "of". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 63 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "said plurality of light dividing elements" lacks antecedent basis in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 48, 57, 59, 60, 61, 75, 76, 77, 78, 80, and 81 are rejected under 35 U.S.C. 102(b) as being anticipated by Lindenblad, US Patent No. 2,686,219.

Lindenblad teaches a image display system that includes a raster multiplying system because:

1) the light splitter multiplies the initial screen by three and the claims do not claim how the P blocks are formed on the surface eg adjacent or superimposed; and

2) misregistration of the three blocks by light converger 18a will cause at least one extra pixel to be formed on the surface.

Claim 48:

Lindenblad teaches an image display system comprising:

(a) at least one complementary screen of one of light emitting (*Kinescope 41 is a cathode ray tube which is a light emitting source.*) or light source modulating devices producing light in a two dimensional array of N (a real number) pixels (*Column 7 lines 17-21*), from which array of pixels a plurality of raster elements are generated (*The pixels form raster elements.*);

(b) a raster multiplying system comprising an array of optically connected inter-related light dividing elements (*Light splitter and mirrors 15d and 15e and light dividing element shown in figure 3 where the light splitter split's the light into three paths. Also refer to column 7 lines 23-26.*), each said light dividing element to divide the light of said plurality of raster elements of the complementary screen into parts, a first section of said array arranged to directly receive light from said complementary screen (*The input side of the light splitter receives light from the kinescope.*), a part of which directly received light is passed to at least one other section of said array (*Mirror 15d or alternatively inherent inside of the light splitter as shown by the half mirror of Konuma et al., US Patent No. 5,481,320.*), the light directly received by said first section of said array and the light passed to said at least one other section of said array divided into components to form copies of the raster elements (*Each of the three light paths comprise copies of the raster elements generated by the kinescope 41.*), with said copies of said raster elements forming corresponding raster elements in P blocks (*Lindenblad teaches three blocks which is a number within the set of applicants claimed P.*), each block of said P

blocks generally comprising a two dimensional array of said raster element copies (*Each path is an image which is a two dimensional image, see column 3 lines 68-75.*); (c) an array of controllable modulators (*Keyer 24a controls light modulators 13d, 13e, 13f. Refer to column 7 lines 26-36.*) located after said raster multiplying system, each modulator of said array to independently modulate the raster elements of one of said P blocks so that light in each block is modulated separately and simultaneously: and (d) a surface on which said P image blocks of a total number of M pixels are formed and displayed (*The retina of the eye is a surface.*), where the number M exceeds the number N (*This is met by Lindenblad for at least two reasons:*

1) Each modulator forms a different colored pixel, thus, P times N pixels are formed, the claim does not claim how the P blocks are formed on the surface eg adjacent or superimposed; and

2) misregistration of the three blocks by light converger 18a will cause at least one extra pixel to be formed on the surface.) and where said surface preceding components of (a), (b) and (c) are placed in the mentioned order of the light path of the complementary screen (*Kinescope 41 is followed by the light splitter and mirrors which are followed by the light modulators controlled by keyer 24a*).

Claim 77:

Lindenblad teaches a system as in claim 48 further comprising means for optic compression of complementary screen raster elements (*As can be seen in figure 3 the kinescope 41 is much larger than the retina of the eye, thus, optic compression has*

occurred.) for increasing brightness and pixel density (*The result of this optic compression is increased brightness per unit area of the surface of the retina.*).

Claim 78:

Lindenblad teaches a system as in claim 48 further comprising partly transparent mirrors as said light dividing elements (*This is inherent in the light splitter since it is a block diagram element which by inference includes prior art light splitters such as the half mirror of Konuma et al., US Patent No. 5,481,320.*at shown by).

Claim 80:

Lindenblad teaches an image display system as claimed in claim 48 further comprising a light conductor (*The light path in Lindenblad from kinescope 41 to the light splitter and mirrors 15d and 15e and then to light modulators 13d, 13f, and 13e to light converger to surface of retina is a light conductor since the path conducts light.*) to transmit the light from said complementary screen to the image surface via said raster multiplying system light receiving part.

Claim 57:

This method clam corresponds to system claim 48 and claims the same functions that claim 48 claims, therefore claim 57 is rejected for the same reasons given for claim 48.

Claim 59:

Lindenblad teaches a method as in claim 57 wherein a raster element comprises more than one pixel because each pixel of the kinescope forms a red pixel, a green pixel and a blue pixel.

Claim 60:

This method clam corresponds to system claim 77 and claims the same functions that claim 77 claims, therefore claim 60 is rejected for the same reasons given for claim 77.

Claim 61:

Lindenblad teaches a method as in claim 57 wherein a raster element is of the size of only one pixel because each pixel made by the kinescope may be considered a raster element.

Claim 75:

Lindenblad teaches to one of ordinary skill in the art generating a 3D image from said image display surface. At column 3 lines 70-75 teaches receiving light from a real object. Real objects are three dimensional objects. Thus, the image of the real object is projected onto the image display surface of the eye which generates a 3D image of the real object to the human brain.

Claim 76:

This method clam corresponds to system claim 56 and claims the same functions that claim 56 claims, therefore claim 76 is rejected for the same reasons given for claim 56.

Claim 81:

This method clam corresponds to system claim 80 and claims the same functions that claim 80 claims, therefore claim 81 is rejected for the same reasons given for claim 80.

9. Claim 63 is rejected under 35 U.S.C. 102(e) as being anticipated by Ezra et al., U.S. Patent No. 5,666,226. Ezra teaches copying a 4x 4 matrix of pixels into many copies, each copy is then individually modulated to generated an image on a plane. This claim replaces the light dividing elements of claim 57 with a lens raster matrix which is taught by Ezra's microlens array 3.

An analysis of claim 57 plus claim 63 follows:

Ezra teaches a method for forming an image on an image display surface by forming a plurality of constituent blocks of said image, so that the image is presented as comprised of a plurality of blocks (*The raster elements generated by the array of illuminators 1 or SLM 12 is multiplied by forming copies of those raster elements onto each modulator of SLM 4.* See figures 1- 3. Each element of *SLM 4 receives $M_x X M_y$ raster elements from the array of illuminators 1 or SLM 12, see column 3 lines 23-26. Therefore* each element of *SLM 4 is one of P blocks of $M_x X M_y$ raster element copies.*), comprising the steps of:

(a) providing at least one complementary screen having a two dimensional array of N pixels (*The array of illuminators shown in figure 2 and the SLM 12 shown in figure 3 are a two dimensional complementary screen having an array of N pixels.*) and generating from said array of pixels a plurality of raster elements (*Micro-lenses on array 3 multiples the number of pixels by the number of micro-lenses. Each one of light emitting or light source modulating elements generates a raster element that will be multiplied by the micro-lenses and projected onto the film or diffuser plane 5.*);

(b) using a raster multiplying system (*micro-lens array 3*) comprising (63. (Previously presented) A method as in claim 57 comprising the use of a lens raster matrix instead of said plurality of light dividing elements.) to form copies of the raster elements (*The raster elements generated by the array of illuminators 1 or SLM 12 is multiplied by forming copies of those raster elements onto each modulator of SLM 4.*), , said copies of said raster elements forming corresponding raster element in P blocks (*Each modulator of SLM 4 is one of P blocks of M_x X M_y raster element copies. P corresponds to the number of elements of SLM 4.*), each block of said P blocks generally comprising a two dimensional array of raster element copies (*P blocks of M_x X M_y raster element copies.*);

(c) independently modulating said beam components corresponding to the raster element copies c f each of said P blocks (*P blocks of M_x X M_y raster element copies.*);

(d) repeating the procedure of generating other raster elements from said complementary screen (*Each of the pixels of the array of illuminators 1 or of SLM12 is repeatedly generated. See column 2 lines 41-44.*); and

(e) displaying the P image blocks having a total number of M pixels on an image display surface, where M is greater than N (*Film or diffuser plane 5.*).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 50, 55, 56, 58, 67, 71, and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lindenblad, US Patent No. 2,686,219, in view of Ezra et al., U.S. Patent No. 5,666,226.

Claims 50 and 58:

Lindenbald does not teach a plurality of said complementary screens.

Ezra teaches with reference to figure 4 a plurality of said complementary screens.

It would have been obvious to one of ordinary skill in the art to modify Lindenbald to include a plurality of said complementary screens, kinescope 41, because two smaller complementary screens may be more feasible than one larger complementary screen, see Ezra at column 3 lines 42-52, which teaches having a plurality of said complementary screens overcomes problems stemming from having a large complementary screen.

Claim 71:

Lindenbald does not clearly teach a photosensitive plane.

Lindenbald does teach image recording since the eye's retinal converts the image into an electrical signal that is recorded in the brain.

Ezra teaches a system as in claim, 48 used for image recording (*At least column 1 lines 5 and 45, column 2 lines 37-40 and 52, and column 5 lines 29 and 41 discusses using the multiplied raster matrix for printing purposes.*) further comprising:

(e) instead of said image surface a photosensitive plane (*Column 2 lines 37-40 discusses how the printing is performed by using a film of photographic emulsion.*) on which an outer image to be recorded is produced (*The image produced in the emulsion film is recorded since it is a non changing copy of the image. This claim does not claim any specifics of the recording.*), said outer image comprising a plurality of said blocks, each block being of a two dimensional array of pixels, and al: said blocks comprising said M pixels, where the number M exceeds the number N, and where said system components of (a), (b) and (c) are placed in the mentioned order of the light path of the complementary screen; and

(i) means to scan said outer image on said photosensitive plane into electric signals for recording (*The light that impinges upon the film 5 is an electrical signal which has been scanned onto the film for recording purposes.*).

It would have been obvious to one of ordinary skill in the art to modify Lindenbald to perform image recording by using a photosensitive plane because Lindenbald suggests this by using the retina of the eye as the photosensitive surface which

converts light into an electrical signal which is recorded in the human brain and because Ezra teaches to one of ordinary skill in the art by the use of a photosensitive plane that a photosensitive plane is desirable.

Claim 55:

See the above discussion of claims 50 and 58.

Claim 56:

See the above discussion of claim 77.

Claim 73:

Lindenbald does not clearly teach a photosensitive plane.

Lindenbald does teach image recording since the eye's retinal converts the image into an electrical signal that is recorded in the brain.

73. (Previously presented) A method as in claim 57 used for image recording wherein said image display surface of step (e) comprises a photosensitive plane on which an outer image is produced (*Refer to the discussion of claim 71 concerning the photosensitive plane.*) and further comprising that step (b) is followed by:

(f) converting the image information received on said plane by the projection of said beam components into P electric signals, one signal for one of said P blocks, for recording received information for P separate image elements (*As the P blocks are*

scanned onto the retina P electric signal are produced and supplied to the human brain for recording.); and

(g) repeating the procedure by successively generating other raster elements on said complementary screen (*As the image in received kinescope 41 successively generates other raster elements.*), to simultaneously scan each of P blocks (*The light splitter causes P blocks of raster elements to be simultaneously scanned.*).

It would have been obvious to one of ordinary skill in the art to modify Lindenbald to perform image recording by using a photosensitive plane because Lindenbald suggests this by using the retina of the eye as the photosensitive surface which converts light into an electrical signal which is recorded in the human brain and because Ezra teaches to one of ordinary skill in the art by the use of a photosensitive plane that a photosensitive plane is desirable.

Claim 67:

Lindenblad teaches a method as in claim 73 wherein a raster element comprises a plurality of pixels because the red, blue, and green elements present in the red path, blue path, and green path may be considered pixels.

10. Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lindenblad, US Patent No. 2,686,219, in view of Pu et al., U.S. Patent No. 5,483,365. Parts a, b, c and d of this claim correspond almost identically to parts a, b, c, and d of claim 48. The difference is this claim claims a 3D holographic image display system in the preamble and comprises an additional part (e) a coherent light producing means for producing a 3D holographic image from said surface. Another difference is part (c) does not include the modulated separately and simultaneously limitation, thus, part (c) of the claim is broader than corresponding part (c) of claim 48.

Ezra teaches the claimed invention except for a coherent light producing means for producing a 3D holographic image from said surface.

Pu teaches this missing feature and gives motivation for modifying Lindenbland in order for Lindenbland's system to produce a holographic image. It would have been obvious to one of ordinary skill in the art at the time of applicants invention to use Lindenbland's display system to form the image formed by Pus' spatial light modulator 50 because Lindenbland produces a high resolution image and Pu stores a high resolution hologram image which teaches a high resolution display is needed to form the high resolution hologram image.

A detailed analysis of the claim 69 follows.

Claim 69:

Lindenblad does not teach 3D holographic. Lindenblad teaches an image display system (*Refer to the discussion of claim 48.*) comprising:

(a) at least one complementary screen of one of light emitting or light source modulating devices in a two dimensional array of N (a real number) pixels, from which array of pixels a plurality of raster elements are generated (*Refer to the discussion of claim 48.*) ;

(b) a raster multiplying system comprising a plurality of passive and at least partly light transmitting elements to form copies of said generated raster elements of a said at least one complementary screen, with said raster element copies forming a raster in P blocks with each block generally comprising a two dimensional array of pixels (*Refer to the discussion of claim 48.*);

(c) an array of controllable modulators located after said raster multiplying system each modulator of said array to independently modulate the raster elements of one of said P blocks (*Refer to the discussion of claim 48.*);

(d) Lindenblad substantially teaches a surface on which a hologram blocks of total number of M pixels are formed, where the number M exceeds number N and where said surface preceding components of (a), (b) arid (c) are placed in the mentioned order of the light path of the complementary screen (*Refer to the discussion of claim 48. Lindenblad does not teach the hologram blocks. Pu teaches this at column 3 lines 3-9.*) ; and

(e) a coherent light generator for producing a 3D holographic image from said surface (*Lindenblad does not teach this. Pu teaches this at column 3 lines 9-15. Laser 20 is a coherent light generator that generates reference beam R, see column 2 lines 64-66. It would have been obvious to one of ordinary skill in the art at the time of*

applicants invention to use Lindenblad's display system to form the image formed by Pus' spatial light modulator 50 because: Lindenbland produces a high resolution image and Pu stores a high resolution hologram image which teaches a high resolution display is needed to form the high resolution hologram image.).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:00 to 3:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael

Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeffery A Brier
Primary Examiner
Art Unit 2672